(54) **A device for playing a game**

(57) The device comprises a visual display (10), control means (IC_5-IC_9, OR_1, $NAND_1$, etc.) and a plurality of player controls (PB_1-PB_4), the control means being adapted to index the display until any one of the player controls is activated and to initiate a display indicating the said one of the player controls.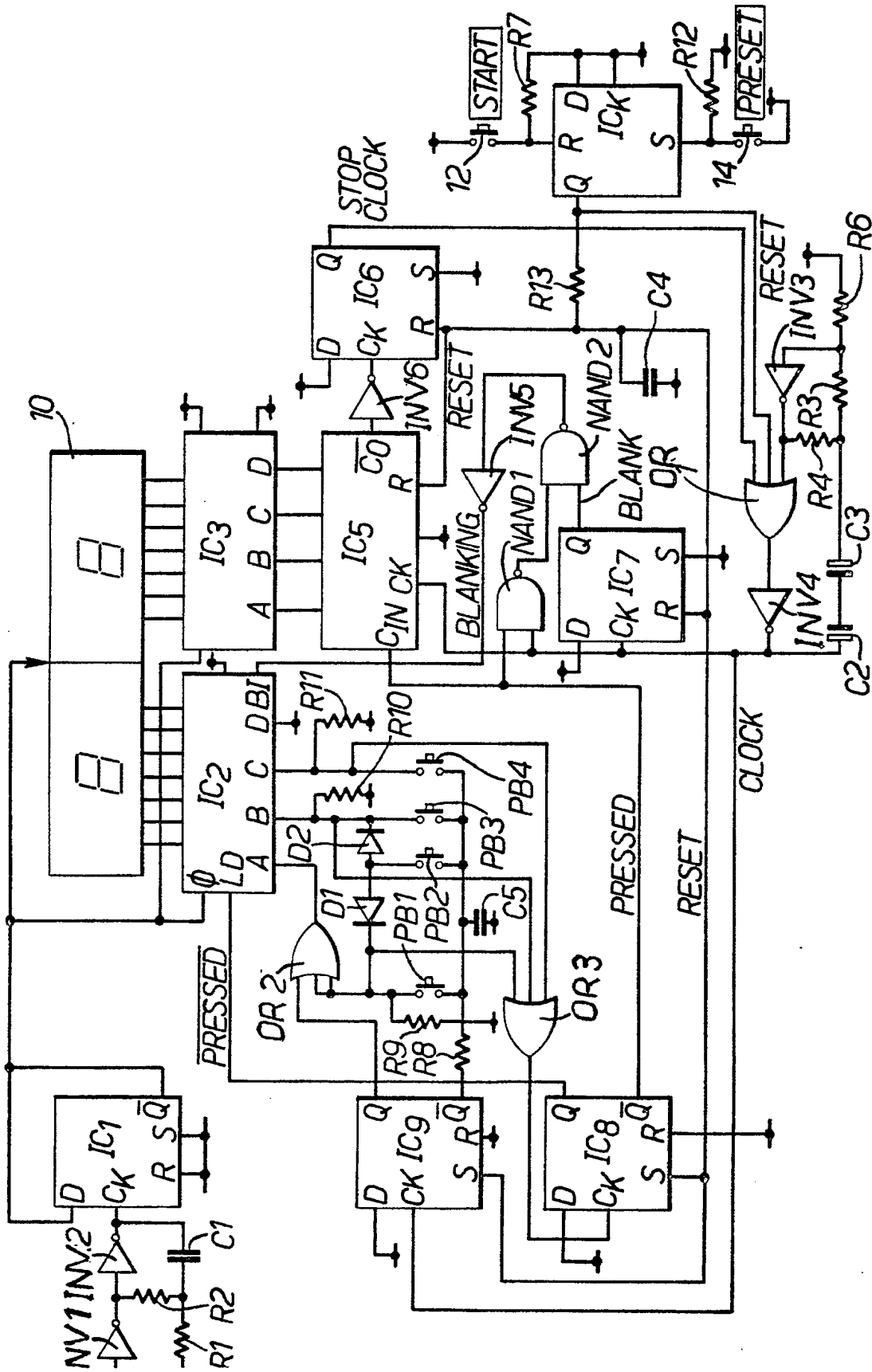 The device is particularly suitable for use as a constituent of a larger game and has specific application to games in which bidding is involved e.g. for cards or in a simulated antiques auction. The display may, in particular, be in the form of light emitting diodes, a digital display or may display various symbols such as card suits or the faces of a die.

The drawing(s) originally filed was/were informal and the print here reproduced is taken from a later filed formal copy.

2118445

1/1
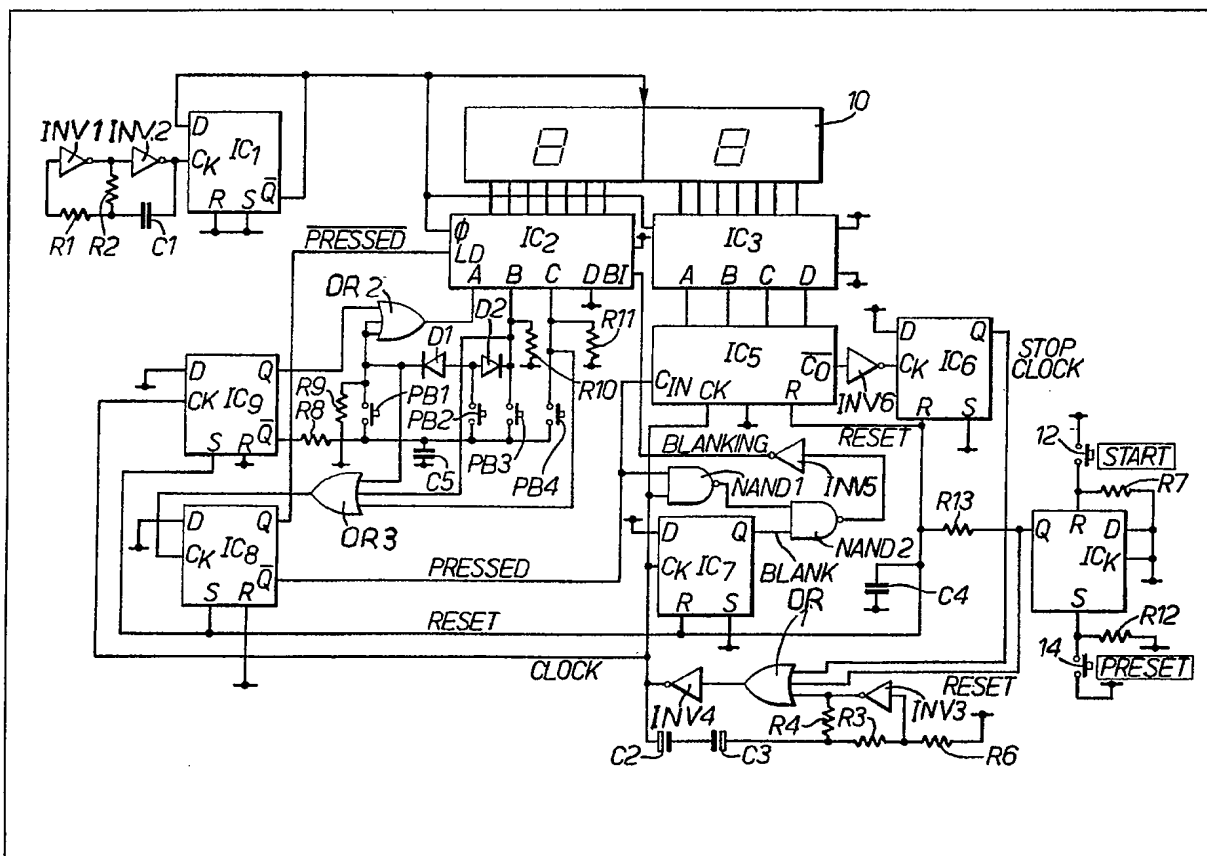
SPECIFICATION

A device for playing a game

5 The present invention relates to a device for playing a game and more particularly to such a device having a   5
visual display means.
    According to the present invention there is provided a device for playing a game comprising a visual
display, control means and a plurality of player controls, the control means being adapted to index the
display until any one of the player controls is activated and to initiate a display indicating the said one of the
10 player controls.   10
    The present device is particularly suitable for use as a constituent of a larger game and has specific
application to games in which bidding is involved.
    The device can be used in combination with one or more packs of conventional playing cards in order to
provide an enhanced degree of player control over the progress of the game. Instead of drawing cards
15 randomly, the players use the present device to bid for individual cards. The strength of bidding for a card   15
may depend not only on the individual desire to obtain the card but also the extent to which the player feels
that his ultimate goal will be disclosed by such bidding. Many conventional card games can be adapted to
benefit from using the present device in playing the game.
    Use of dice can be replaced by the device of the present invention and such replacement can result in
20 adaptation of the game to a more sophisticated form. Instead of relying upon a random result from throwing   20
one or more dice, the players can exercise a certain degree of control upon the progress of the game because
the device of the present invention can be influenced by skill and therefore avoid random influences within
the game.
    Embodiments of the present invention will now be described by way of example only and with reference
25 to the accompanying single figure of drawing which shows a circuit diagram which constitutes one   25
embodiment of the invention.
    In the illustrated circuit the visual display means is formed by a two digit LCD unit 10, each digit display
having seven independantly energisable segments. Hamlin component number 39 35 31 30 50 can be used
as the LCD unit 10. Four player buttons PB1, PB2, PB3 and PB4 are provided and these are each housed in
30 respective separate consoles which may be hand held. The player buttons PB1, PB2, PB3, PB4 are connected   30
to the remainder of the circuit by respective leads, although for the sake of simplicity the player buttons are
illustrated as simple circuit components. The circuit includes a start button 12 and a reset button 14. The start
button 12 initiates indexing of the LCD 10 and the reset button 14 returns the display to its initial state. The
player, start and reset buttons are switches of the type in which the contacts are closed only while the switch
35 is held in a closed position.   35
    The remaining circuit components are mounted on a circuit board which is housed in a casing. The LCD 10
and the start and reset buttons 12, 14 are situated prominentely on the casing.
    The device operates in the following manner. Each of the players holds a respective player button and all
players position themselves so that the LCD unit 10 can be easily viewed. The device is switched on using a
40 supply master switch (not shown. LCD unit 10 displays numeral 10. When all players are ready, the start   40
button 12 is depressed and indexing of the display is thereby initiated, from 10 downwards to 0. The players
have a predetermined criteria or criterion for halting the indexing of the right hand digit, the criteria
depending upon the game being played. When a player depresses a player button the indexing of the right
hand digit ceases and the left hand digit pulses in order to identify the player button which was first
45 depressed. The left hand digit identifies the player button by numerical association. In the present   45
embodiment one of numerals 1 to 4 is displayed and each of the player button is marked with the
appropriate numeral. Depressing the reset button 14 returns the LCD unit 10 to display 10.
    The circuit arrangement shown in the accompanying drawing and which substains the above described
operation will now be described.
50   The LCD unit 10 is driven by an oscillator and an associated flip-flop, IC_1. The oscillator comprises resistors   50
R1 and R2, capacitor C1 and inverters INV1 and INV2 connected in series. The oscillator period is set by R2
and C1, R1 providing feedback to sustain oscillation. Output from the oscillator clocks IC1 whose R and S
inputs are held inactive, at logic 0. IC1 is connected as a toggling divide-by-two flip-flop, and its $\overline{Q}$ output
establishes a 60 Hz unity mark/space ratio backplane drive for LCD unit 10. The 60 Hz signal is also used to
55 provide the phase input for IC2, a BCD-to-7-segment decoder/driver which drives the left hand   55
seven-segment digit of LCD unit 10, and IC3, an identical device which drives the right hand digit of LCD unit
10.
    The circuit incorporates a second oscillator which comprises capacitors C2 and C3, resistors R3, R4 and R6,
two inverters INV3 and INV4 and a 3-input OR gate OR1.
60   The basic circuit arrangement is similar to the first oscillator with the addition of OR1 and R6. The oscillator   60
period is set to approximately 1 Hz by C2, C3 and R4 and provides signals to clock the down counter IC5,
which governs the indexing of the right hand digit, and also to pulse the left hand digit when a player button
has been activated, *via* NAND1 and NAND2. The same signal feeds the clock inputs of flips-flops IC7 and IC9
which govern the operation of the left-hand digit.
65   OR1 allows the output of this oscillator to be gated as required. A logic '1' at either of the two inputs not   65

connected to R4 will hold the 'CLOCK' output low. R6 is included to ensure start-up when both these inputs are low.

One of these inputs is taken from the Q output of the reset flip-flop IC4. This is connected as an R-S flip-flop with its D and Ck inputs tied to logic '0', and its R and S inputs normally taken to logic '0' via R7 and R12. The R input is connected to the supply rail (logic '1') when the START button 12 is activated, and the S input is connected to logic '1' when the RESET button 14 is activated. Thus the Q output of IC4 is at logic '1' during the reset state and logic '0' when the device is operating.

All reset functions apart from the clock gating are derived from a delayed version of IC4 Q output, so that the initial clock transition is ignored. The delay is provided by R13 and C4, a simple R-C network with a time constant of about one microsecond. This signal, labelled 'RESET', feeds the reset inputs of IC5, IC6 and IC7 and the set inputs of IC8 and IC9.

Once initiated by pressing START button 12, the second 'CLOCK' output positive-going transition accomplishes three functions: firstly, it clocks IC7 Q outputs high, thereby blanking the left hand digit via NAND2, INV5 and IC2 blanking input. Secondly, it clocks IC9 Q output low and Q output high, signals marked '1' and 'I'. This removes the '1' input to IC2 and enables the player buttons. Thirdly, it clocks the down counter IC5 from 0 down to 9. Further pulses (at 1-second intervals) have no effect on IC7 or 9 but clock IC5 further down towards 0, thus accomplishing the indexing of the right hand digit.

The left hand digit must be arranged to show a '1' while the device is in the reset state. This is achieved by IC9 and a 3-input OR gate OR2. In the reset state, IC9 Q output is held at logic '1' by the high level on its S input. This is fed to IC2 input A via OR2 and, since the B, C and D inputs are held at logic '0', the display output is '1'. Since the player button common terminals are fed from IC9 Q output which is also at logic '0', activating any of the player buttons at this time has no effect on the display.

If any of the player buttons are pressed while the right hand digit is indexing from 9 to 0, then indexing is halted and a digit is displayed as the left hand digit of LCD unit 10 to identify the player button which was first depressed.

One terminal of each player button is connected to IC9 $\overline{Q}$ output via R-C network R8 and C5. This output (I) goes high on the second positive transition of the clock as explained previously; the rising edge is slowed by R8 and C5 to prevent a false pulse being coupled through the stray capacitance of the player button leads.

The second terminals of the player buttons 2 and 4 are connected directly to the B and C inputs of IC2, which are normally held at logic '0' by R10 and R11. The D input is held at logic '0' directly. Player button 1 is connected to the A input via two paralleled inputs of OR2, which are normally held at logic '0' by R9. Player button 3 is connected via diodes D1 and D2 to player buttons 1 and 2. Thus a binary code will appear at the A, B and C inputs of IC2 corresponding to whichever player button is activated.

A further 3-input OR gate, OR3, is contained within the circuit. OR3 has one input connected to the second terminal of player button 1 and D1 cathode, a second input connected to the second terminal of PB2 and a third input connected to the second terminal of PB4. Consequently depressing any of the player buttons generates an output from OR3. This output clocks IC8, whose D and R inputs are connected to logic '0'. In the quiescent state, IC8 Q output is high and its $\overline{Q}$ output is low.

When a button is pressed, IC8 Q output ($\overline{PRESSED}$) goes low thus latching in data present on the A, B, C, D inputs of IC2 via the LD (latch disable) input of IC2, and preventing further changes in the data input from appearing on the left hand digit display. (The response time of this circuit is very fast - of the order of 100 nanoseconds - and this makes for a negligible probability that the circuit will accept more than one button as having been pressed, i.e. the first one always 'wins'.)

Simultaneously the $\overline{Q}$ output (PRESSED) goes high. This output is connected to one input of NAND1 and to the $\overline{Cin}$ input of IC5. The $\overline{Cin}$ input going high disables the clock input of IC5 and hence prevents further indexing of the right hand digit display once a button is pressed. At the same time, clock pulses are allowed to pass via NAND1, NAND2 and INV5 to the BI (blanking) input of IC2, thereby pulsing the left hand digit display at the clock frequency.

It is necessary, in the event of the right hand display reaching 0 without any player button being activated, for the indexing to be halted at this point and no further action taken. This is accomplished by connecting the $\overline{Co}$ output of IC5 via INV6 to the clock input of IC6. When IC5 reaches count 0 the $\overline{Co}$ output goes low clocking IC6 Q output high (IC6 D input is connected to logic '1'). This signal (STOP CLOCK) is connected to the third input of OR1 and therefore gates the clock oscillator in the same way as the reset signal (see earlier).

Return of the circuit to its initial state, i.e. a continuous display of 10, is achieved by depressing the RESET button 14. This button takes IC4 S input high and hence sets IC4 Q output (RESET) to logic '1'. This action stops the clock oscillator if it is not already stopped by IC6, resets flip-flops IC6 and IC7 and counter IC5 (to 0), and sets flip-flops IC8 and IC9. The device is then once again ready for the START button 12 to be depressed to initiate indexing of the display.

Circuit functions are fabricated from the specified standard components:

IC1/4, IC6/7, IC8/9	MC14013 dual D-type flip-flop	
IC2, IC3	MC14543 7-segment LCD latch/decoder/driver	
IC5	MC14510 BCD up/down counter	
Inverters	MC14584 hex schmitt inverter	
NAND gates	MC14011 quad NAND	
OR gates	MC14075 triple 3-input OR	
	or their equivalents.	

Although the above embodiment initiates indexing from a display of 10, it is possible to arrange the circuit so that the right hand digit only is associated with indexing, that is, restricting the indexed display to a single digit.

The above embodiment of the device has been described with a two digit display. The type of display can be varied as desired. If it is intended that the device should be capable of use by a relatively large number of players simultaneously then it is feasible for the display to be duplicated so that it can be readily viewed by all players. Where the device is intended for use in combination with or as part of another game the form of display may be advantageously varied. For example, if the left hand digit display is replaced by a display which sequentially or cyclically displays symbols representing the suits of a pack of cards, then exciting possibilities are presented for enhancing a host of many conventional card games such as Rummy, Black Maria, Poker, etc. The left hand digit could be replaced by a display which sequentially or cyclically displays the faces of a die or dice, thus making the device readily applicable to a large range of many other conventional games.

Identification of the player buttons by the left hand digit does not have to be numerical and any suitable system can be adopted.

An alternative embodiment utalising an arrangement of LEDs will now be briefly described. Ten LEDs are arranged in a circle and are sequentially identified by numerals 1 to 10. A plurality of player buttons are provided as in the previous embodiment but in comparison with activation of the left hand digit each player button has a separate lamp which is illuminated when the player button is operated. The circuit can ensure that only the lamp associated with the first operated player button is illuminated. The mode of operation of this embodiment is similar to that of the previous embodiment and indexing of the display is acheived by sequential switch-on or switch-off of the LEDs.

The device is particularly advantageously in playing conventional or new games in which an element of bidding is involved. Bidding is repesented by indexing of the right hand digit and the successful bid is indicated by the left hand digit which is activated by the first player button to be depressed. The players have to decide how far they can allow indexing to continue so as to obtain the lowest count without another player halting the indexing first. The device can be arranged so as to index upwards instead of downwards so as to benefit some games and a change over circuit could be provided to achieve this.

Many games are suitable for using the bidding feature of the device. Games can be based directly upon the bidding, for example, the game may comprise a simulated antiques auction. The bidding may be less direct, for example, where the players bid to obtain members of a set - such as in the well known game 'Happy Families'. The bidding function can also be used in games where the object is to form patterns or territory upon a grid. In such a case the display could sequentially or cyclically present arrows indicating movement from one grid reference to the next or alternatively the actual grid references can be displayed. The players use the bidding feature of the device for each grid position.

CLAIMS

1. A device for playing a game comprising a visual display, control means and a plurality of player controls, the control means being adapted to index the display until any one of the player controls is activated and to initiate a display indicating the said one of the player controls.

2. A device as claimed in claim 1, wherein each player control is in the form of a respective hand held unit.

3. A device as claimed in claim 1 or 2, wherein the control means indexes the display with a fixed period.

4. A device as claimed in any preceding claim, wherein the display is in the form of a digital display.

5. A device as claimed in claim 4, wherein the display comprises a two digit display which is indexed by the control means from a display of 10, the left hand digit indicating the said one of the player controls, wherein the number of player controls is limited to a maximum of 10.

6.   A device as claimed in any of claims 1 to 3, wherein the display means comprises a plurality of light emitting diodes the state of illumination of which are sequentially switched by the control means in order to index the display.

7.   A device as claimed in any of claims 1 to 3, wherein the display is capable of simulating the faces of a die.

8.   A device as claimed in any of claims 1 to 3, wherein the display is capable of simulating the suits of a pack of cards.

9.   A device as claimed in claim 8, wherein the display is capable of simulating each member of a pack of cards.

10.   A device for playing a game substantially as hereinbefore described with reference to the accompanying drawing.